CLAIMS

1. A process for producing polyhydroxyalkanoates (PHA) by microbial fermentation which comprises culturing a microorganism that converts carbon to PHA in a medium in which the primary carbon source is xylose and the secondary carbon source is levulinic acid.

2. The process of claim 1 in which the PHA is a co-polymer comprising 3-OH-valeryl (3-HV) and 3-OH-butyryl (3-HB) monomers.

3. The process of claim 2 in which the xylose is derived from the xylans present in hemicellulose.

4. The process of claim 3 in which the hemicellulose is derived from forest biomass.

5. The process of claim 3 in which the levulinic acid is derived from organic waste.

6. The process of claim 4 in which the levulinic acid is derived from forest biomass.

7. The process of claim 1 in which the ratio of HV to HB is modulated by adjusting the ratio of xylose to levulinic acid.

8. The process of claim 1 in which an additional amount of levulinic acid is added to the culture medium after a period of about 2 to about 96 hours.

9. The process of claim 8 in which the ratio of xylose to levulinic acid in the fermentation medium after the additional amounts of levulinic acid are added ranges from about 0.01 to about 1.0.

10. P(3HB-co-3HV) prepared by the process of claim 1.

11. A process for preparing xylose suitable for use in a microbial culture medium from a composition that is the hemicellulosic fraction of a woody biomass which comprises, sequentially:

    a. adjusting the pH of the composition to above neutral;

    b. adjusting the pH to below neutral;

    c. contacting the acidified preparation with a molecular sieve;

    d. adjusting the pH to about 7; and

    e. removing calcium from the composition.

12. The process of claim 11 in which, in step (a), the pH is adjusted to about pH 8 and the pH is maintained at about pH 7 to about pH 8 for about 30 to about 120 minutes, in step (b), the pH is adjusted to about pH 5 to about pH 6 and, in step (c), the molecular sieve is activated charcoal.

13. The process of claim 12 in which volatile solvents are removed from the hemicellulosic fraction prior to adjusting the pH to above neutral.

14. The process of claim 12 in which the composition is subsequently filter sterilized.

15. The process of claim 14 in which nutritional supplements to enhance microbial growth are added to the composition prior or subsequent to filter sterilization.

16. The process of claim 1 in which the xylose is oxidized or otherwise derivatized prior to or after addition to the culture medium.

17. The process of claim 1 in which the levulinic acid is oxidized or otherwise derivatized prior to or after addition to the culture medium.